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July 2, 2004

Marlene Dortch, Esq.
Secretary
Federal Communications Commission
445 12th Street, SW
Washington, DC 20554

Re: ET Docket No. 98-153
***Ex Parte* Submission of**
Short Range Automotive Radar Frequency Allocation Group (SARA)

Dear Ms. Dortch:

The Short Range Automotive Radar Frequency Allocation Group ("SARA") hereby submits these *ex parte* comments in response to the *Further Notice of Proposed Rulemaking* issued in the above-referenced docket. 1/ Composed of a diverse group of automotive industry companies 2/ working together to promote the deployment of safety-enhancing vehicular radars, SARA has always advocated a competitively-neutral regulatory environment that will provide automakers and their customers with the largest possible variety of devices from which to choose. SARA is concerned that the Commission's current average power measurement procedures will unfairly and unnecessarily disadvantage certain device developers.

1/ Revision of Part 15 of the Commission's Rules Regarding Ultra-Wideband Transmission Systems, ET Docket 98-193, *Memorandum Opinion and Order and Further Notice of Proposed Rulemaking,* FCC 03-33 (rel. March 12, 2003) ("*Further Notice*").

2/ SARA's members include A.D.C., Bosch, Delphi Automotive Systems, Hella, InnoSent, Megamos, Siemens VDO, TRW, Tyco Electronics, Valeo, Visteon, Audi, BMW, DaimlerChrysler, Fiat, Ford, General Motors, Jaguar, MAN, Opel, Porsche, Saab, Seat, Skoda, Volkswagen and Volvo.

To avoid such an outcome, SARA urges the Commission: (1) for pulsed frequency-hopping ("FH") radar, to permit average power measurements to be performed with the hopping active, and (2) for pure impulse radar, to permit average power measurements to be performed without the pulse train being gated on. [3]/ Neither modification would increase the risk of interference, for the reasons described below.

As Siemens VDO and M/A-COM have explained in their own filings, application of the current measurement requirements for average power would force a reduction of 6 dB in peak transmit power for the pure impulse radar, and more than a 7 dB reduction for pulsed FH radar. A reduction in the transmit power would likewise reduce the detection ranges. Such notable performance degradations would limit the road safety benefits of these devices and would thereby severely impact their marketability.

There is no reason for the rules to discriminate against the modulation techniques employed by these manufacturers, as there is no greater risk of interference from these devices. The operation of UWB vehicular radars is limited to the 22-29 GHz band, which contains the following authorized services: Earth Exploration Satellite Service ("EESS"), Radio Astronomy Service ("RAS"), and Fixed Services ("FS"). For EESS and RAS, potential interference is evaluated based on an aggregation of the emissions from many radars within the geographic area covered by the satellite receiver's footprint or the RAS antenna pattern. Because the radar devices are not synchronized in time, both the EESS and RAS receivers are protected from harmful interference by the Commission's average power limit. The average power consists of all the radar emissions averaged over a given geographic area and integration time, which results in an overall "smoothing" of the individual pulses from the radar devices. Both the quiescent period and the frequency hopping of individual radars merge in this spatio-temporal integration of a very large number of devices, resulting in a spectral power density that is uniformly distributed both in time and frequency to a great extent. Moreover, taking the root mean square ("RMS") measurement with a 1ms integration time ensures that: (1)

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[3]/ Section15.521(d) generally requires that power measurements of UWB devices be conducted with the pulse train gated on, where the transmitter is quiescent for intervals that are long compared to the nominal pulse repetition interval. Although the Commission never explained the rationale for section 15.521(d), there does not appear to be any basis for its application in the 24 GHz band. Perhaps in recognition of such situations, the rule also states that "[a]lternative measurement procedures may be considered by the Commission." Thus, SARA is hereby requesting that the Commission consider the alternative procedure discussed herein.

there are no long quiescent periods, and (2) that the measured integration time is less than that of the victim receivers.

For FS, protection from harmful interference is provided by the Commission's peak power limit for modulation techniques that have a high Crest factor (*i.e.*, peak-to-average ratio). The Commission has already recognized that a "UWB system with a high peak-to-average ratio would be peak-limited." [4]/ Thus, for vehicular radar devices with a high Crest factor, it is the peak limit, not the average limit, that protects FS operations from harmful interference. It is not surprising, therefore, that the record contains no indication of concern from any FS licensee with regard to the potential for harmful interference from 24 GHz vehicular radars, even assuming the use of time averaging to measure average power levels.

Because there is no increased risk of harmful interference, the Commission should permit time averaging over gated pulse trains as well as over hopped frequencies. Failing to permit measurements to be taken in this manner would result in inaccurate average power measurements. Siemens VDO has demonstrated this point through detailed technical showings [5]/ submitted in this proceeding, and the NTIA has independently confirmed that a pulsed frequency hopping radar "can be accurately measured while it is operating in a frequency hopping mode." [6]/ Similarly, in its "Working Document Towards a PDNR" for UWB measurement techniques, ITU-R Task Group 1/8 recently excluded the proposed requirement, contributed by the US administration, to take measurements with the pulse train gated on (the same requirement as that contained in section 15.521(d)) from the jointly agreed text and put it up for reconsideration at the next ITU TG1-8 meeting. [7]/

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[4]/ Revision of Part 15 of the Commission's Rules Regarding Ultra-Wideband Transmission Systems, ET Docket 98-153, *First Report and Order*, FCC 02-48 (rel. April 22, 2002) at ¶ 243.

[5]/ *See, e.g.*, Comments of Siemens VDO filed in docket 98-153 (July 21, 2003).

[6]/ NTIA, "Measurements of Siemens Pulsed Frequency Hopping Vehicular Radar Prototype," Mar. 20, 2003 at 37.

[7]/ *See* Document 1-8/TEMP/64 at Section 6.1.7.3. and its corrigendum version.

As the Commission has established in many other contexts, it should strive to provide a competitively and technologically neutral regulatory environment. [8]/ A modification of the Commission's measurement procedures as discussed above, limited to vehicular radars operating in the 22-29 GHz band, would ensure a level playing field in the 24 GHz vehicular radar market that would promote competition in the provisioning of these safety-enhancing devices.

Respectfully submitted,

/s/ Ari Q. Fitzgerald

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[8]/ *See, e.g.*, Federal State Joint Board on Universal Service, *Report and Order*, 12 FCC Rcd 8776, 8802-03 (1997) ("the principle of competitive neutrality . . . should include technological neutrality. Technological neutrality will allow the marketplace to direct the advancement of technology, and all citizens to benefit from such development").